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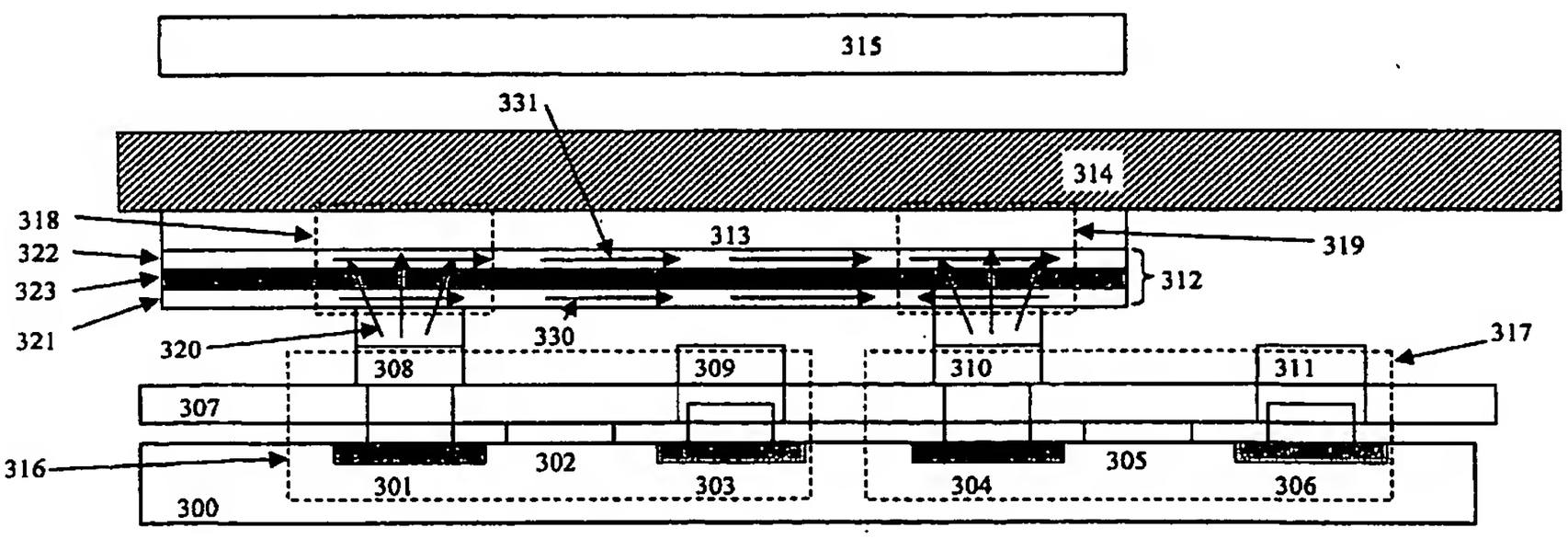
(54) Title: NANO-CONTACTED MAGNETIC MEMORY DEVICE



(57) Abstract: A magnetic memory device includes a plurality of transistors (316, 317) formed on a substrate and a common magnetic memory block (312) including multiple effective magnetoresistive elements (318, 319), a ferromagnetic recording (321), a non-magnetic space (323), and a free magnetic reading (322) layer formed above the transistors (316, 317). An extended common digital line (315) is located above the common magnetic memory block (312). The common magnetic memory block (312) is electrically connected with a respective source/drain electrode of the transistors (316, 317) through each a contact at a respective active area. The specific magnetization state of the ferromagnetic recording layer at the active areas can be changed by a heating process and applying an external field induced from the common digital line (315) and the bit (309, 311) or word (307) or word (307) lines. The change in resistance of the effective magnetoresistive element (318, 319) can be detected by means of changing the magnetization state of the free magnetic reacting layer during reading, thus a smaller switching field is required.

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